

APPARATUS AND METHOD FOR MOVING CONTENTS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to an apparatus and method for moving contents, particularly, to an apparatus and method for moving contents capable of moving contents having a restricted number of copies to another storage media.

2. Description of the Background Art

Recently, due to rapid growth of computer and communication technologies, information and communication has been more important in everyday life as well as science and business. Particularly, in the current information age, since every country in the world is constructing high speed communications nets competitively, various information will be provided, transmitted and consumed and a considerable part of such information will be secured by the copyright law.

Recorders, video recorders and copy machines using the analogue method make differences in quality between the original and the copy in costs, time and convenience and accordingly, those things can not actually affect the copyright.

However, works on information and communication media such as the Internet affect the copyright much since the copy and the original are 100%

identical and through the Internet images and voices as well as texts can be transmitted to the whole world.

Also, in the broadcasting field, the TV transmitting method is digitalized by generalization of the digital compression technology and development of inexpensive receivers and accordingly, copy of contents through broadcasting affects the copyright much.

In the information age where all works such as images and records are digitalized, infringement of the copyright is eased and done in various forms and accordingly, exposing and getting rid of infringement of the copyright is difficult.

Therefore, since writing will is decreased and distribution of intellectual property rights is hindered unless the infringement of intellectual properties is prevented or the technologies for exposing the infringement is prevented, enterprises related to copyrights are making much effort to develop copy protecting technology as a technological means to secure works.

In the present, as a general technology for protecting copy, there is a method of restricting the number of copy to a certain number by inserting a copy control code in a header part of contents. The above technology will be applied to broadcasting contents as the digital broadcasting is popularized and the technology is partly now in use.

Figure 1 is a schematic block diagram showing a copy apparatus of a conventional digital broadcast receiver.

As shown in Figure 1, the conventional digital broadcast receiver includes a TV broadcast receiver 100 for receiving contents which a broadcasting station transmitted and a recording apparatus 200 for storing the received contents.

The above TV broadcast receiver 100 includes a receiving unit 110 for

receiving the contents and a first storage medium 120 for storing the contents supplied from the receiving unit 110 and the recording apparatus 200 includes a second storage medium 210 for storing the contents transmitted from the first storage medium 120.

5 The operation of a copying apparatus for the conventional digital broadcasting receiver will be described with reference to accompanied drawings as follows.

10 The receiving unit 110 of a TV broadcasting receiver receives contents transmitted through transmission media such as broadcast satellite or cable and stores the contents in the built-in first storage medium 120. At this time, the possible number of copy of the contents is decreased by one time.

15 With the above storage method, the contents can be stored by the storage command of a user or new contents can be continuously stored automatically deleting old contents at a certain time interval according to the composition of the TV broadcast receiver 100.

 Later, when the user demands to copy the contents to the second storage medium, the TV broadcast receiver 100 reads the contents from the first storage medium and judges the possible number of copy by analyzing the copy control code inserted in the header part of the contents.

20 At this time, as shown in Figure 3, the copy control code uses 2 bits among 4 bits of a synchronous bits in the header part of the data packet and is divided to unrestricted copy, restricted copy, a single copy and no copy according to the set value (00,01,10,11). Also, the other 1 bit is used in an encryption code of the data stream and the least significant bit of the synchronous bits is not used as
25 a reserved bit.

After, TV broadcast receiver 100 reads the copy control code of the stored contents in the first storage medium, the TV broadcast receiver 100 copy the contents to the second storage medium according to the judged possible number of copy.

5 Namely, if the copy control code is set as unrestricted copy (S201), the TV broadcast receiver 100 does not convert the copy control code and copies the contents to the second storage medium (S202 and S203), if the copy control code is set as restricted copy(S204), the receiver 100 stores the contents in the second storage medium 210 after decreasing one time from the possible number of copy by converting the copy control code(S205 and S206). On the contrary, if the copy control code is set as no copy, the TV broadcast receiver 100 can not copy the contents to the second storage medium regardless of demand of the user (S207).

10 By the way, the first storage medium 120 is restricted in the capacity. Therefore, if the copy control code is set as no copy in case the user of the digital broadcast receiver is willing to store the contents for a long time or edit the contents, copying or editing of the contents from the first storage medium 120 to the second storage medium 210 is impossible.

SUMMARY OF THE INVENTION

20 Therefore, an object of the present invention is to provide an apparatus and method for moving contents capable of moving the position of stored contents under the condition that the number of contents is not increased.

Another object of the present invention is to provide an apparatus and
25 method for moving contents capable of efficiently moving contents having a

restricted number of copies to another storage media.

To achieve these and other advantages and in accordance with the purpose of the present invention, as embodied and broadly described herein, there is provided an apparatus for moving contents comprising a input unit for inputting contents and a control unit for controlling moving of the contents to other medium by analyzing a copy control code of the contents.

To achieve the above objects, there is provided a method for moving contents comprising the steps of analyzing a copy control code of the contents when a user selects moving of the contents from a first storage medium to a second storage medium and storing the contents the contents in the second storage medium by converting the copy control code of the contents according to the result of analysis.

The foregoing and other objects, features, aspects and advantages of the present invention will become more apparent from the following detailed description of the present invention when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and together with the description serve to explain the principles of the invention.

In the drawings:

Figure 1 is a schematic block diagram showing a conventional copy

apparatus;

Figure 2 is a flowing chart showing a method for copying contents of Figure 1;

Figure 3 is a view showing a header of a conventional data packet;

Figure 4 is a block diagram showing an apparatus for moving contents in accordance with the present invention;

Figure 5 is a flowing chart showing a method for moving contents in accordance with the present invention;

Figure 6 is a detailed flowing chart showing the step for moving contents of Figure 5; and

Figure 7 is a view showing a header of the packet in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings.

Figure 4 is a block diagram showing an apparatus for moving contents in accordance with the present invention.

As shown in Figure 4, an apparatus for moving contents in accordance with the present invention includes a TV broadcast receiver 400 for analyzing a copy control code of contents received from a broadcasting station, converting the copy control code according to the result of the analysis and outputting the converted code and a second storage medium 500 for storing the contents moved from the TV broadcast receiver 400 through an interface means.

The TV broadcast receiver 400 includes a receiving unit 410 for receiving the contents, a first storage medium 420 for temporarily storing the contents received from the receiving unit 410, a copy control code analyzing unit 430 for analyzing a copy control code of the contents stored in the first storage medium 320, a control unit 440 for controlling the operation of each unit needed to move the contents such as fetching, deleting and code converting from the first storage medium 420, a copy control code converting unit 450 for converting the copy control code of the contents according to the control of the control unit 440 and a data outputting unit 460 for transmitting contents fetched from the first storage medium having the converted copy control code to the second storage medium.

At this time, the second storage medium 500 can be included in the TV broadcast receiver 400, can be independent out of the receiver using a connection means such as a cable or can be included in another apparatuses (for example, a VCR for performing recording).

The operation of the apparatus for the moving the contents in accordance with the present invention will be described with reference to Figures 5 and 6.

The receiving unit 410 of the TV broadcast receiver receives the contents transmitted through the media such as a broadcasting satellite or a cable and stores the contents in the first storage medium 420 included in itself. At this time, the possible number of copy of the contents is decreased by one time.

Later, when the user demands moving the contents, the control unit 440 checks whether the TV broadcast receiver and the second storage medium 500 are connected (S501 and S502). If they are connected, the control unit 440 judges whether an authentication is needed between the TV broadcast receiver 400 and the second storage unit 500 by analyzing the copy control code of the contents

(S503).

Besides, if the copy control code of contents is set as unrestricted copy, the contents does not need any authentication. But if the copy control code of the contents is set as restricted copy or no copy, the contents are to be authenticated to maintain the restricted number of copy.

Therefore, the control unit 440 performs the step 506 in case the copy control code is set as unrestricted copy. But, in case the copy control code is set as restricted copy or no copy, mutual authentication is performed between the TV broadcast receiver 400 and the second storage medium 500 (S504 and S505). At this time, since the TV broadcast receiver 400 and the second storage medium 500 are authenticated by each peculiar key values, in case a medium rejects the authentication demand or the authentication is not succeeded, moving the contents is not possible (S508).

When the authentication between the TV broadcast receiver 400 and the second storage medium 500 is performed successfully (S505), the control unit controls of moving the contents stored in the first storage medium 420 to the second storage medium 500 only in status which the second storage medium 500 can be written (S506 and S507).

Figure 6 is a detailed flowing chart showing the step of moving the contents (S507).

As shown in Figure 6, in the step of moving (S507), the moving operation is performed according to the possible number of copy determined by analyzing the copy control code inserted in the header part of the contents.

Namely, if the copy control code is set as unrestricted copy (possible number of copy is N , $N = \infty$), the copy control code is not converted by the copy

control code converting unit 450 (S601 and S602). Later, the control unit 440 stores the above contents to the second storage medium 500 through the data outputting unit 460 (S603) and then moving the contents is completed by deleting the original contents in the first storage medium 420 (S610).

Also, if the copy control code is set as restricted copy ($N = n$), the copy control code of the contents stored in the first storage medium 420 is increased by one time by the copy control code converting unit 450 (S604 and S605). The control unit 440 stores the contents in the second storage medium 500 through the data outputting unit 450 (S606) and then moving of the contents is completed by deleting the original contents in the first storage medium 420 (S610).

Also, if the copy control code is set as no copy ($N = 0$), the copy control code of the contents stored in the first storage medium 420 is increased by one time by the copy control code converting unit 450 (S607 and S608). Here, in case the copy control code is set as no copy, the above contents are divided to copy control code is set as a single copy or no copy before the contents are stored in the first storage medium 420. At this time, in case the copy control code of the contents is set as no copy, this case is not included in the present invention, because the contents cannot be stored in the first storage medium 420. However, in case the copy control code is set as no copy by being stored in the first storage medium 420, the present invention is applied to the case. Later, the control unit 440 stores the contents to the second storage medium 500 through the data outputting unit 460 and then moving the contents is completed by deleting the original written in the first storage medium 420 (S609 and S610).

Since the contents are moved as above, the number of the contents is same as that of before the movement.

As another embodiment from the above moving method, the present invention sets a moving determination bit in the contents in advance and accordingly, moving of the contents can be performed according to the moving determination bit.

5 Namely, as shown in Figure 7, the present invention sets the least significant bit as a moving determination bit in the synchronous bits and if the contents can be moved, the moving determination bit is set as '1' and if the contents can not be moved, the moving determination bit is set as '0'.

10 Therefore, if the user demands moving the contents to the second storage medium 500 after the contents are temporarily stored in the first storage medium 420 by being received in the receiving unit 410 of the TV broadcast receiver 400, the control unit 440 can judge whether the contents can be copied or not in advance according to the moving determination bit after reading the moving determination bit of the contents.

15 Namely, unless the moving determination bit is set as capable of moving, the contents can not move to the second storage medium 500 and accordingly, the contents can be stored with the copy method as in Figure 2 of the conventional art. However, if the moving determination bit is set as capable of moving, the contents can be moved in the second storage medium 500 as in the process
20 shown in Figures 5 and 6.

As another embodiment from the above TV broadcasting receiver 400, the present invention can be embodied as a processor(not shown) which includes units of TV broadcasting receiver 400, or as a processor(not shown) which is programmed with the above method of moving contents.

25 The method of moving the contents is that the user moves the contents to

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the second storage medium 500 by analyzing and converting the copy control code of the contents after the contents is stored the first storage medium 420, as above described. However, the first storage medium 420 can be included in the Personal Video Recorder, and can be included in another apparatuses (for example, Personal Computer, Digital Video Disc, Digital Video Home System) using a connection means (for example, IEEE1394, Universal Serial Bus).

As described above, the apparatus and method for moving the contents can move the storing position of the contents not increasing the number of the contents.

As the present invention may be embodied in several forms without departing from the spirit or essential characteristics thereof, it should also be understood that the above-described embodiments are not restricted by any of the details of the foregoing description, unless otherwise specified, but rather should be construed broadly within its spirit and scope as defined in the appended claims, and therefore all changes and modifications that fall within the meets and bounds of the claims, or equivalence of such meets and bounds are therefore intended to be embraced by the appended claims.